REMARKS

In the outstanding non-final Office Action of June 2, 2004, the Examiner rejected claims 1-15 under 35 U.S.C. § 103(a) as allegedly being unpatentable over published U.S. Patent Application 2002/0093972 A1 to Hollums et al. ("Hollums") in view of published U.S. Patent Application 2001/0055319 A1 to Quigley et al. ("Quigley").

By this amendment, Applicant amended claims 1, 3-5, 8 and 11-13 to improve form. Claims 16-21 have been added. Claims 1-21 are now pending.

Rejection of Claim 1-15

On page 2 of the outstanding Office Action, the Examiner rejected claims 1-15 as allegedly being unpatentable over Hollums in view of Quigley. Applicant respectfully traverses the rejection.

Amended claim 1 recites a method of granting mini-slots to a cable modem (CM) by a cable modem termination system (CMTS). The method includes maintaining performance statistics of the CM by the CMTS, receiving a bandwidth request by the CMTS from the CM, and determining whether the CM is dynamic burst profile mode capable after receiving the bandwidth request. If the CM is determined to be dynamic burst profile mode capable, assigning a burst profile and granting mini-slots to the CM based on the burst profile and the bandwidth request. If the CM is determined not to be dynamic burst profile mode capable, assigning another burst profile and granting mini-slots to the CM based on the another burst profile and the bandwidth request.

Applicant submits that neither Hollums nor Quigley, whether taken alone or in any combination, discloses or suggests determining whether the CM is dynamic burst profile mode capable after receiving the bandwidth request, as recited in claim 1.

On page 2 of the Office Action, the Examiner alleged that Hollums discloses determining whether the CM is dynamic burst profile mode capable after receiving the bandwidth request, assigning a burst profile and the bandwidth request, and if the CM is determined not to be dynamic burst mode capable, assigning another burst profile and granting mini-slots to the CM based on the another burst profile and the bandwidth request. The Examiner indicated that Hollums, at page 1, paragraphs 9-11 and page 2, paragraph 12 discloses or suggests these features. Applicant disagrees.

Hollums, at page 1, paragraphs 9-11 and page 2, paragraph 12 discloses:

> The current version of DOCSIS (DOCSIS 1.1) uses a request/grant mechanism for allowing remote devices (such as cable modems) to access upstream bandwidth. DOCSIS 1.1 also allows the provision of different services to different parties who may be tied to a single modem. With respect to the processing of packets, DOCSIS 1.1 allows segmentation of large packets, which simplifies bandwidth allocation. DOCSIS 1.1 also allows for the combining of multiple small packets to increase throughput as necessary. Security features are present through the specification of 56-bit Data Encryption Standard (DES) encryption and decryption, to secure the privacy of a connection. DES is also used for authentication. DOCSIS 1.1 also provides for payload header suppression, whereby repetitive ethernet/IP header information can be suppressed for improved bandwidth utilization. DOCSIS 1.1 also supports dynamic channel change. Either or both of the downstream and upstream channels can be changed on the fly. This allows for load balancing of channels, which can improve robustness.
>
> Sometimes it may be necessary to change the PHY parameters in a communications system. For example, user requirements may change such that a different symbol rate is needed. PHY parameters may also have to be changed as a result of changes in the communications environment. For example, if the communications environment becomes noisy, a different

method of error correction coding may be required.

> DOCSIS provides a method in which PHY parameters (i.e, a burst profile) can be changed. Such a change requires a reprogramming of components that handle PHY processing, including PHY devices at the headend. The parameter change process for headend PHY devices is illustrated generally in FIG. 1. The process as illustrated pertains to changing PHY parameters for upstream communications. The process starts with step 105. In step 110, the new PHY parameters for a given upstream channel are determined. In step 115, an upstream channel descriptor (UCD) is formulated. The UCD is a message sent from the headend to remote devices and contains the new PHY parameter values. In step 120, the UCD is sent downstream. In step 125, a determination is made as to the point in the upstream at which the new parameters are to take effect. In step 130, a downstream MAP message is formulated stating when, in the upstream, the change is to occur. Note that such a message is commonly denoted in capitalized form, "MAP"; this convention is used hereinafter. The role of MAP messages, generally, is to manage the upstream transmissions of remote devices. Such a message typically allocates, i.e., maps, specific time intervals in the upstream to specific remote devices, thereby allowing a given remote device to transmit upstream only in a specified time interval.
>
> Note that upstream time intervals are defined based on a clock having a predetermined frequency, such as 10.24 MHz. Such a clock can, in some systems, be interpreted in terms of time units, or "ticks." Each tick can, for example, be 6.25 microseconds. Ticks can be further organized into larger units called minislots. The number of ticks per minislot can be defined at the discretion of the headend. The available upstream bandwidth can therefore be viewed as a series of minislots. Moreover, MAP messages allocate the upstream bandwidth in terms of minislots.

Thus, Hollums discloses that DOCSIS 1.1 supports dynamic channel change and that either the downstream or the upstream channels or both channels can be changed on the fly. This feature provides the ability to load balance channels, which can improve robustness. Hollums also discloses that DOCSIS provides a method by which PHY parameters can be changed by sending an upstream channel descriptor message, including the new PHY parameter values, from a headend to remote devices.

Applicant submits that nothing in the cited portion of Hollums or any other portion of Hollums discloses or suggests determining whether the CM is dynamic burst profile mode capable after receiving a bandwidth request.

It appears that the Examiner may be indicating that the statement, "DOCSIS 1.1 also supports dynamic channel change," (Hollums, page 1, paragraph 9) is equivalent to stating that a CM is dynamic burst profile mode capable. Applicant disagrees.

Applicant wishes to direct the Examiner's attention to Hollums, at page 1, paragraph 7, lines 19-15, which discloses:

> Moreover, the upstream can be organized into a number of channels, with several remotes assigned to each channel. This arrangement allows the headend to manage each upstream communications channel. In this manner, upstream communications are managed so as to maintain order and efficiency and, consequently, an adequate level of service.

Thus, Hollums discloses that the upstream can include multiple channels with several remotes assigned to each of the channels. Therefore, Applicant submits that the above statement, regarding DOCSIS 1.1 supporting dynamic channel change, refers to the ability to dynamically change a channel and has nothing to do with determining whether the cable modem is dynamic burst profile mode capable.

Further, Applicant submits that the disclosure of Quigley fails to satisfy the deficiencies in the disclosure of Hollums. Therefore, Applicant submits that claim 1 is patentable over Hollums in view of Quigley, whether taken alone or in any reasonable combination, and respectfully requests that the rejection of claim 1 be withdrawn.

Claims 2-7 depend from claim 1 and are patentable for at least the reasons discussed above regarding claim 1. Further, Applicant submits that claims 2-7 are patentable for reasons of their own.

For example, claim 6 recites that the method further comprises using a registration process for determining whether the CM is dynamic burst profile capable. Applicant submits, at least for the reasons discussed above with respect to claim 1, that Hollums and Quigley fail to disclose or suggest determining whether the CM is dynamic burst profile mode capable. Therefore, Hollums and Quigley, whether taken alone or in any combination, cannot disclose or suggest using a registration process for determining whether the CM is dynamic burst profile mode capable.

Similarly, neither Hollums nor Quigley, whether taken alone or in any combination, discloses or suggests using the bandwidth request for determining whether the CM is dynamic burst profile mode capable, as required by claim 7.

Amended claim 8 recites a method for increasing physical layer flexibility in a cable modem system. The cable modem system includes a cable modem (CM) coupled to a cable modem termination system (CMTS) through an access network. The method includes providing the CMTS that is capable of maintaining performance statistics of the CM and receiving a bandwidth request from the CM, determining whether the CM is dynamic burst profile mode capable, assigning a burst profile from a group of burst profiles communicated to the CM, and granting mini-slots to the CM, where the number of mini-slots granted to the CM is dependent on whether the CM is dynamic burst profile mode capable.

Applicant submits, for reasons similar to the reasons provided with respect to claim 1, that neither Hollums nor Quigley, whether taken alone or in any combination, discloses or suggests determining whether a CM is dynamic burst profile mode capable, as recited in claim 8. Therefore, Applicant respectfully requests that the rejection of claim 8 be withdrawn.

Further, Applicant submits that neither Hollums nor Quigley, whether taken alone or in any reasonable combination, discloses or suggests granting mini-slots to the CM, where the number of mini-slots granted to the CM is dependent on whether the CM is dynamic burst mode capable, as recited in claim 8.

Hollums, at page 2, paragraph 12, discloses:

> Note that upstream time intervals are defined based on a clock having a predetermined frequency, such as 10.24 MHz. Such a clock can, in some systems, be interpreted in terms of time units, or "ticks." Each tick can, for example, be 6.25 microseconds. Ticks can be further organized into larger units called minislots. The number of ticks per minislot can be defined at the discretion of the headend. The available upstream bandwidth can therefore be viewed as a series of minislots. Moreover, MAP messages allocate the upstream bandwidth in terms of minislots.

Thus, Hollums discloses that the upstream bandwidth can be allocated in terms of mini-slots. However, Hollums fails to disclose or suggest that the number of mini-slots granted to the CM is dependent on whether the CM is dynamic burst mode capable, as recited in claim 8. The disclosure of Quigley also fails to satisfy this deficiency of Hollums.

Claims 9-15 depend from claim 8 and are patentable at least for the reasons discussed above with respect to claims 9-15. Therefore, Applicant respectfully requests

that the rejection of claim 8 be withdrawn. Further, Applicant submits that claims 9-15 are patentable for reasons of their own.

For example, claim 14 recites a feature that is similar to claim 6 and is patentable over Hollums in view of Quigley for at least reasons similar to the reasons provided with respect to claim 6.

Claim 15 recites a feature that is similar to claim 7 and is patentable over Hollums in view of Quigley for at least reasons similar to the reasons provided with respect to claim 7.

New Claims

New claims 16-19 are patentable over the cited references for at least depending from claim 1. Similarly, new claims 20-21 are patentable over the cited references for at least depending from claim 8. Further, Applicant submits that new claims 16-21 recite features not disclosed or suggested by the cited references, whether taken alone or in any combination.

Conclusion

All rejections having been addressed, Applicant submits that the application is now in condition for allowance and a notice to that effect is earnestly solicited.

Applicant respectfully requests that the Examiner contact Applicant's representative at the number indicated below if he wishes to discuss any aspect of this case.

To the extent necessary, a petition for an extension of time under 37 CFR 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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